

Remarks

The above amendments and these remarks are responsive to the Office Action mailed January 13, 2006. Applicants thank the Examiner for carefully considering the subject application.

Before discussing the Office action in detail, Applicants believe that it may be useful to review some background information. The present application is directed to reducing noise from a tailpipe of a vehicle. Specifically, the inventors herein have recognized that turbulent exhaust gas pulses exiting the outlet of the exhaust pipe into the atmosphere can contact an outer surface of the exhaust pipe proximate the outlet and vibrate the end of the pipe. As a result, the vibrations can generate undesirable noise at the exhaust pipe outlet. Thus, the inventors herein have recognized that it possible to utilize a noise attenuation device upstream of the exhaust pipe outlet configured to reduce noise generated at the outlet. Specifically, claim 1 now recites:

A noise attenuation device for a vehicle exhaust system, comprising:
an exhaust pipe having a passageway for receiving exhaust gas pulses from an engine, said pipe having an outlet at a termination of the pipe, said outlet leading to ambient; and,
a plurality of vanes disposed upstream of an said exhaust pipe outlet, said vanes extending from an inner surface of said exhaust pipe and spaced apart from one another, said vanes configured to reduce turbulence in said exhaust gas pulses passing through said exhaust pipe outlet to reduce noise at said exhaust pipe outlet, where said vanes are substantially proximate to said exhaust pipe outlet, and where said exhaust pipe is substantially unobstructed between said vanes and said exhaust pipe outlet.

In this way, it is possible to address noise at the pipe outlet.

Turning now to the cited art, Applicants respectfully submit that neither Nakase nor Kim show or suggest the above structure, nor can they achieve such advantageous results.

NAKASE, U.S. Patent 5,970,963

First, Nakase et al. fails to show various limitations of claim 1. For example, Nakase et al. fails to show a plurality of vanes disposed upstream of an exhaust pipe outlet, where the vanes are substantially proximate to the exhaust pipe outlet, and where the exhaust pipe is substantially unobstructed between said vanes and said exhaust pipe outlet.

Second, Nakase et al. is simply inapplicable to the approach of claim 1 since it teaches away from such a configuration. In other words, it shows an apparatus for reducing flow noise in a throttle valve, and specifically teaches reducing such noise by placing an apparatus (4) downstream of the throttle valve (3) as shown in Figure 1 of Nakase et al. However, the vanes of claim 1 are configured to reduce noise at an outlet of the exhaust pipe, not noise downstream of a throttle.

The Office action indicates that the limitations relating to the positioning are merely “intended use.” Applicants disagree, as the “configured to” language of claim 1 is structural, thereby differentiating the claimed apparatus from the cited reference. Nevertheless, Applicants have positively recited the pipe outlet and the location of the vanes proximate to the outlet to further clarify the structural limitations of the claim.

Third, Applicants respectfully submit that one skilled in the art would be utterly at a loss in applying the teachings of Nakase et al. to the problem of noise at a vehicle tailpipe outlet. Specifically, Nakase et al. teaches that the disclosed vanes should be placed *downstream* of the noise generator (e.g., the valve). However, as a tailpipe outlet leads to ambient, there is no disclosed way in Nakase et al. as to how to place vanes downstream of an outlet. As such, one skilled in the art could not be motivated to follow Nakase et al. in order to arrive at the approach of claim 1.

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As such, Applicants respectfully request the rejection of claim 1 be withdrawn. The above arguments further apply to claims 13 and 25.

KIM, U.S. Patent 5,113,838

Regarding Kim, again, Applicants respectfully submit that the reference is inapplicable to claim 1. Kim discloses an air flow system comprising a swirling device for improving the properties of an air and fuel mixture and the performance of the engine. Applicants have reviewed Kim and find no mention of placing the device proximate the exhaust pipe outlet. Further, Applicants can find nothing that describes attenuating noise at an exhaust pipe outlet. Rather, Kim is concerned with increasing mixing of an air and fuel within the intake or exhaust manifold. Therefore, Applicants respectfully request the rejection be withdrawn. Again, the above arguments apply to claims 13 and 25.

Rejections under 35 USC § 103

Applicants respectfully traverse the rejection of claims 2, 4, 8, 14 and 19 under U.S.C. 103(a) as obvious over Nakase et al. or Kim for at least the reason that neither Nakase nor Kim, alone or in combination, discloses or suggests all of the elements of any of these claims.

First, claims 2, 4 and 8 depend from and include all of the elements of claim 1 and claims 14 and 19 depend from and include all of the elements of claim 13. As described above, neither Nakase et al. nor Kim discloses every element of claims 1 and 13.

Second, Kim addresses only the problem of backpressure at an exhaust manifold entrance, and therefore fails to recognize the problem of noise at an exhaust pipe outlet to ambient. Likewise, Nakase et al. recognizes only the problem of noise from the convergence of

air downstream of a throttle valve, and not the problem of noise at an exhaust pipe outlet. As described above, the apparatus Nakase et al. is located downstream of a throttle valve. As such, neither reference recognizes the problems solved by Applicants, nor suggests the solutions claimed by Applicants.

Third, regarding claims 8 and 19, Applicants object to the Examiner's assertion that Applicants' own specification supports the obviousness rejection. Applicants' own disclosure cannot be used to rectify deficiencies in the prior art, or to indicate that certain modifications are within the skill of the art. Nowhere does Applicants' specification indicate that one skilled in the art would be able to make the asserted modifications without reference to the application. As such, the rejection of claims 8 and 19 should be withdrawn.

New Claims

Applicants herein present new claim 25 for consideration.

Based on the foregoing comments, the above-identified application is believed to be in condition for allowance, and such allowance is courteously solicited. If any further amendment is necessary to advance prosecution and place this case in allowable condition, the Examiner is respectfully requested to contact the undersigned by fax or telephone at the number listed below.

Please charge any cost incurred in the filing of this Amendment, along with any other costs, to Deposit Account No. 06-1510. If there are insufficient funds in this account, please charge the fees to Deposit Account No. 06-1505.

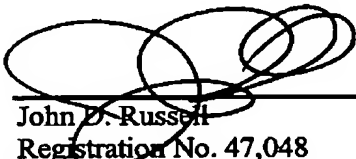
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I hereby certify that this correspondence is being sent via facsimile to the U.S. Patent and Trademark Office at (571) 273-8300 on March 13, 2006.


Lauren Barberena

Respectfully submitted,

ALLEMAN HALL MCCOY RUSSELL &
TUTTLE LLP


John D. Russell
Registration No. 47,048
Customer No. 36865
of Attorneys for Applicants
806 SW Broadway, Suite 600
Portland, Oregon 97205
Telephone: (503) 459-4141
Facsimile: (503) 295-6679